

Exploring Population Patterns

Thousands of people enjoy a sporting event in England

Before READING

Making Connections

Think about your neighbourhood. Where are most homes located? Why is this? Now, look at a population map of Canada. Using your knowledge of physical geography, predict why you think certain areas have larger communities.

People are complex social animals. They can live, work, and play in big crowds, but they need some privacy and quiet too. Are you a person who likes the excitement and commotion of busy places or big events, or would you rather take a quiet walk? Do you prefer living, working, and playing in large or small groups? There are some regions of the world with such great numbers of people that you regularly find yourself surrounded by crowds and noise. At the same time, there are regions so empty that you would often be in a small group or even alone.

In this chapter, you will interpret patterns of population distribution and density, and learn about the main factors affecting world population trends. A strategic card game will allow you to practise your understanding of population growth and decline. You will also construct a population pyramid to make predictions about Canada's population in the future. This chapter will give you insight into the unit's big idea: **How do patterns in human geography affect people around the world?**



Gardens can offer space for quiet reflection.

Questions to Consider as You Read this Chapter

- What do linear, scattered, and clustered settlement patterns tell about population and land use?
- What factors can I use to compare places with high and low population densities?
- What are the main factors affecting population distribution?
- How can I predict job skills that will be needed as Canada's population grows?
- How can I construct population pyramids to predict population trends?

Thinking About Literacy

Reading Graphs

At the end of this chapter you will be asked to create a population pyramid. A population pyramid is a type of graph that shows information about age groups of people in a country. As you go through this chapter, you will see different types of graphs used to study and present geographical information. You can read more about graphs in the Skills Tool Kit, page S 16.

While you read: Add to the following chart for each graph you find in this chapter.

Page #	Graph/Type	Notes

Population Distribution and Density

Rate your views on each population issue below using a scale from 1 to 5, as shown in the margin. Record your answers by letter and number in your notebook. Afterward, compare your views with others.

- 1 Agree strongly
- 2 Agree somewhat
- 3 Unsure or no opinion
- 4 Disagree somewhat
- 5 Disagree strongly

- a) A small community is the ideal place to live.
- b) The population of our community is too large.
- c) A country with a large population is more important in the world.
- d) At 33 million, Canada already has enough people.
- e) The earth has the resources to support a larger population.
- f) At 6.6 billion, our world is dangerously overpopulated.

Canada had 1/200th of the world population in 2007.

There are no right or wrong answers to these questions. For example, the earth does have abundant natural resources, but there are two basic problems—many people badly misuse these resources, and each person in a developed country like Canada uses a much greater share than someone in a developing country such as Nigeria. You will learn more about this imbalance in Chapter 3.

WEB LINK •.....

To study maps of Canada's population, visit our Web site.

Type of Place	Typical Population	Examples	Population (2006)
hamlet	Fewer than 200	Scandia, AB Ballymote, ON	137 100
village	200–1000	Saint-Célestin, QC Burk's Falls, ON	762 893
town	1000–10 000	Lillooet, BC Smooth Rock Falls, ON	2324 1473
small city	10 000–50 000	Moose Jaw, SK Kenora, ON	32 132 15 177
city	50 000–100 000	Red Deer, AB Sault Ste. Marie, ON	82 772 74 948
metropolitan area	More than 100 000	Halifax, NS Ottawa, ON	372 858 812 129

Which type of community do you live in? How might this have affected your answers to the questionnaire at the top of the page?

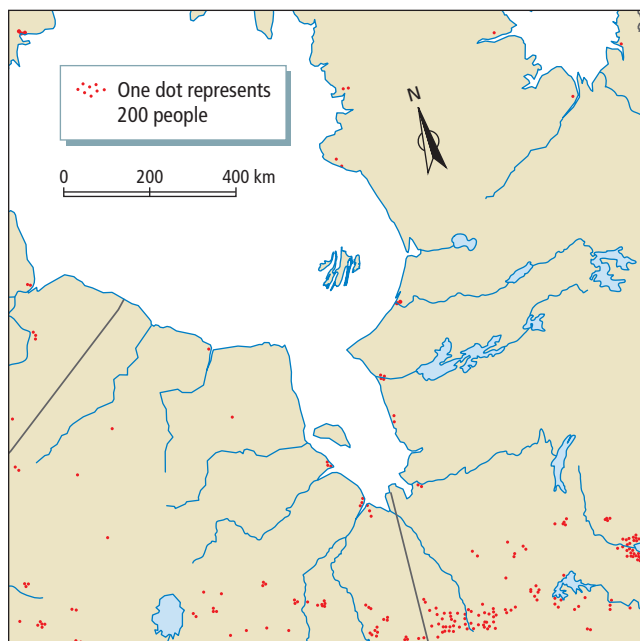
Population Distribution

Rural, urban, and suburban communities would look different if you saw them on a **dot distribution map**. This type of map uses dots to show the spread of population. Each dot represents a certain number of people. For example, in the maps on these pages, one dot represents 200 people. Larger populations mean a greater concentration of dots. The arrangement of dots may form a pattern following a natural or human feature, such as a shoreline or a highway. Geographers use dot distribution maps to identify three **population distribution** patterns: scattered, clustered, and linear.

Scattered Population

Picture this TV commercial. A man struggles through Canada's treeless northern tundra. He finally reaches an isolated store, only to find that his favourite soft drink is not sold there. Disappointed, he begins to search for another place that sells his brand.

He will not find another store soon, because people are far apart in the North. **Scattered population** occurs where resources are limited and can support only small numbers of people. Australia's interior is mostly dry desert, where people may work on isolated ranches or in mining towns. The settlement pattern of northern Canada is similar, but for different reasons. Cold conditions and rocky terrain have resulted in a scattered pattern of settlement, based on hunting, mining, and support services. Aboriginal populations in the past also followed this population pattern.



Scattered Population

Use a map of Canada to find the area shown here. Then, suggest two reasons why this region has a scattered population.

MATTER

dot distribution map a map that uses dots to show population

population distribution the pattern of where people live

scattered population a population distribution in which there are few people in a large area. Vast areas with scattered resources can produce a scattered population pattern.

During

READING

Checkpoint

Imagining a picture in your mind is called visualization. Good readers visualize whenever they read.

Our Environment

Fragile Environments

Regions with widely scattered populations often have fragile environments easily affected by human activity. Permanently frozen ground called permafrost underlies large areas of northern Canada. Global climate change is melting the upper layers of the permafrost zone, causing buildings and roads to sink and collapse.

Use information on climate change in Canada to make a flow chart showing the effects of climate change on the arctic environment.

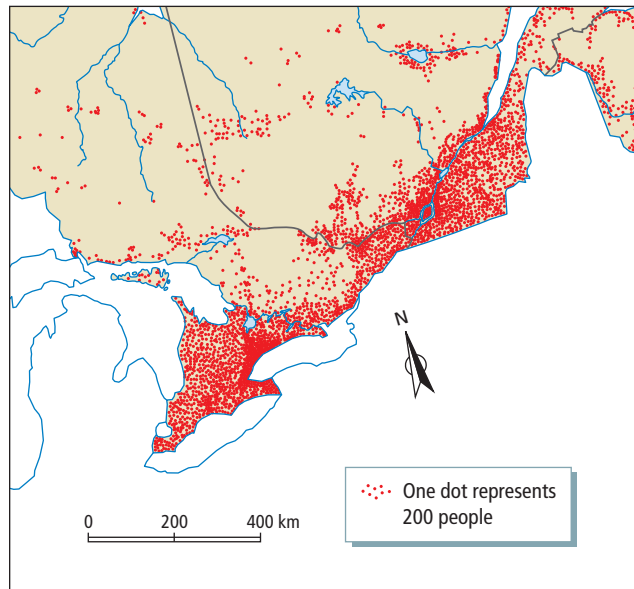
WORDS MATTER

clustered population a population distribution in which many people live in a small area of closely spaced houses or communities

census metropolitan area an urban area with a population of at least 100 000

Clustered Population

Clustered population patterns form when many people settle together in a relatively small area. This may happen where there is a favourable climate, rich natural resources, and major transportation routes. These situation advantages draw people and industry. There are 27 **census metropolitan areas** in Canada, from Victoria, British Columbia, to St. John's, Newfoundland and Labrador. Metropolitan Toronto is the largest, with 5 406 300 people (2006).

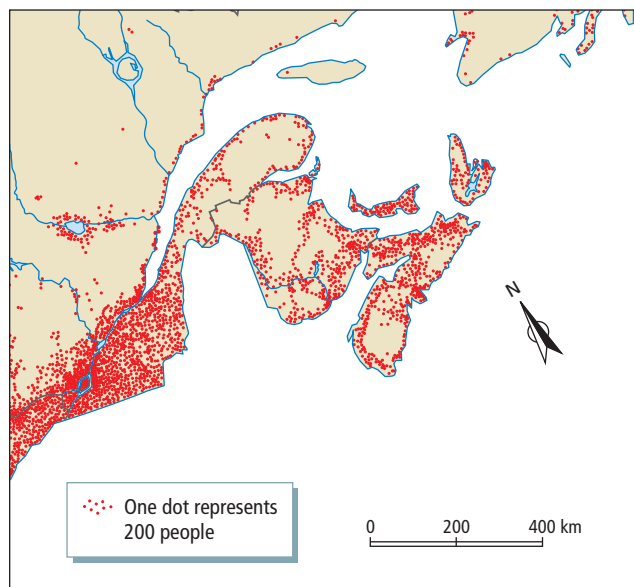


Clustered Population

Use a map of Canada to find the area shown here. Suggest two reasons why this region has a clustered population.

Linear Population

A **linear population** pattern occurs where natural and human-made routes cause settlement to be arranged in a line. Rivers such as the St. Lawrence in Canada and the Nile in Egypt have communities along their banks. These settlements probably developed when the



Linear Population

Use a map of Canada to find the area shown here. Then, suggest two reasons why this region has a linear population.

During READING

Checkpoint

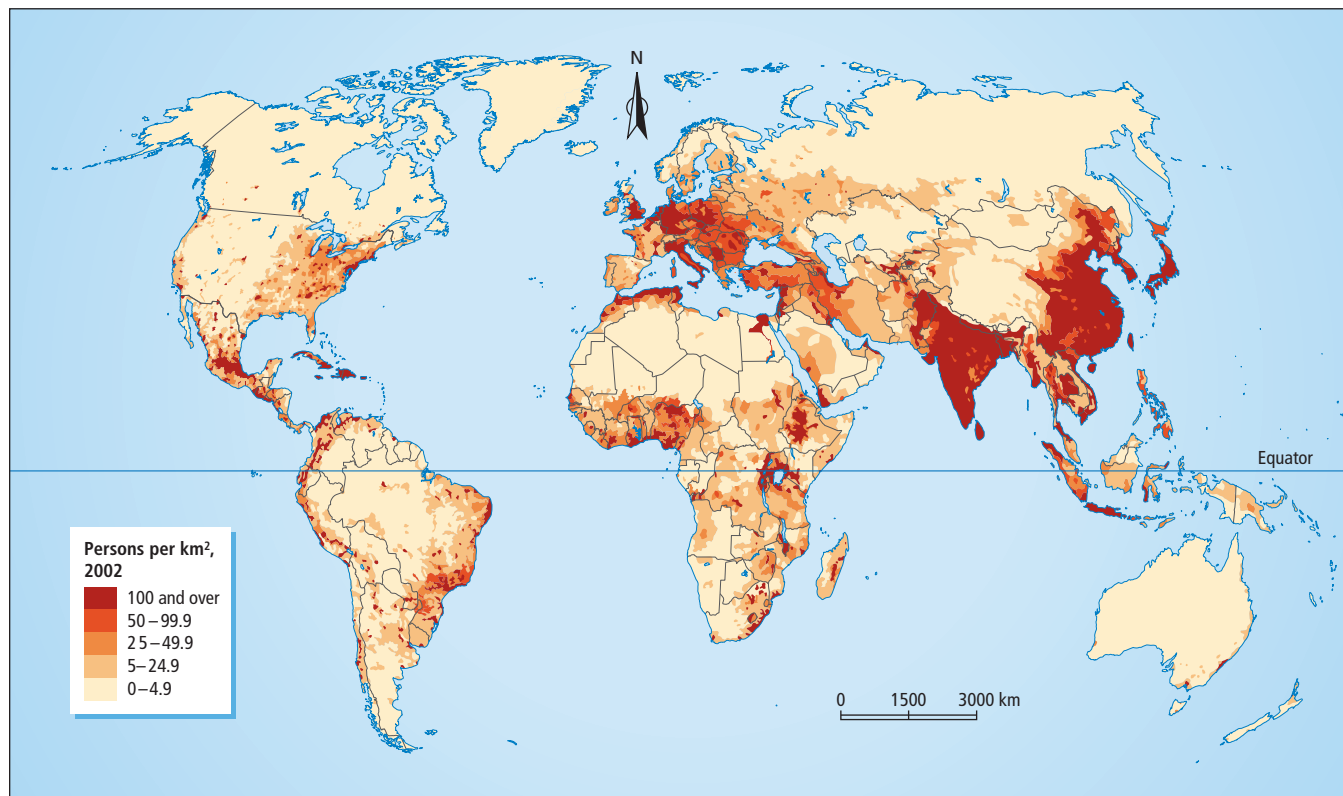
Connect the word **linear** to your math vocabulary: linear means *line*.

WORDS MATTER

linear population a population distribution which is arranged in a narrow line, perhaps along a road, river, or valley

ivers were the main transportation routes. When railways were built across the Canadian West, stations were built at intervals along the lines. Communities developed at most of these places because the trains stopped there for passengers and grain shipments.

World Population Densities



How does Canada's population distribution and density compare to other areas of the world? What factors can help explain this?

Population Density

Population density is a measure of how many people occupy an area of land. Your classroom has an area of about 100 m². When just one person is in the classroom, the population density of the room is 1 person per 100 m². This is the same as 10 000 people per km².

Bangladesh, in Asia, has about 1100 people per km², one of the highest densities in the world. Each person in Bangladesh has less space than one small school—just 9 classrooms. The small Asian territory of Macau has an amazing density of 16 205 people per km². Each person there has only as much space as about half of your classroom.

In contrast, Canada's population density is only about 3 people per km², one of the world's lowest. That is like having one person wandering through 3000 empty classrooms!

Formula for Population Density

$$\frac{\text{Population}}{\text{Area in km}^2} = \frac{\text{people}}{\text{per km}^2}$$

WORDS MATTER

population density number of people occupying a certain area, calculated using the formula above

High Density: India
(Above 150 people per km²)

Area: 3 287 263 km²

Population: 1 134 403 000

Density: 345 people per km²

Urban centres in India are densely populated. Millions have left rural areas and added to the soaring populations of cities such as Mumbai, Kolkata, or Delhi. High population density means that many farms are too small to allow rural families to achieve a decent standard of living.



Moderate Density: Egypt
(Between 50 to 150 people per km²)

Area: 1 000 250 km²

Population: 72 850 000

Density: 73 people per km²

Deserts cover large areas of Egypt, so the population is not evenly distributed. Instead, it is concentrated in the valley and the delta of the Nile River. The community shown here, Port Ghalib, is on the Red Sea. The cities of Cairo and Alexandria are very densely populated compared to isolated desert communities.



Low Density: Australia
(Below 50 people per km²)

Area: 7 682 300 km²

Population: 20 310 000

Density: 2.6 people per km²

Vast areas of Australia's interior desert are completely uninhabited or support only tiny populations. Most of the north is tropical rain forest where few people live. Australians largely occupy only the eastern edge and the southeastern and southwestern corners of the continent. Five cities alone hold half of Australia's total population.



How Is Population Density Used?

The profiles of Egypt and Australia have shown you how uneven population density can be. Even relatively empty Australia is crowded along the beautiful beaches of its famous “Gold Coast.” Dividing a country’s population by its area gives a very general picture. However, density is useful when comparing countries to one another. Population densities of regions and cities help governments plan hospitals and other services where they are needed most.

Country	Area (km ²)	Population (2005)	Population Density
Afghanistan	652 225	25 067 000	
Albania	28 748	3 154 000	
Algeria	2 381 741	32 854 000	
Angola	1 246 700	16 095 000	
Argentina	2 766 889	38 747 000	
Australia	7 682 300	20 310 000	
Austria	83 855	8 292 000	
Azerbaijan	86 600	8 352 000	
Bahamas	13 939	323 000	
Bahrain	691	725 000	



WORLD RECORDS

Macau: The Highest Population Density

Area: 28.2 km²

Population: 456 989

Density: 16 205 people per km²

Macau is located on the coast of China. It is almost entirely urban; most food, water and energy must be imported. Tourism and manufacturing pay for these necessities. However, Macau is changing as it works to reclaim land from the sea.

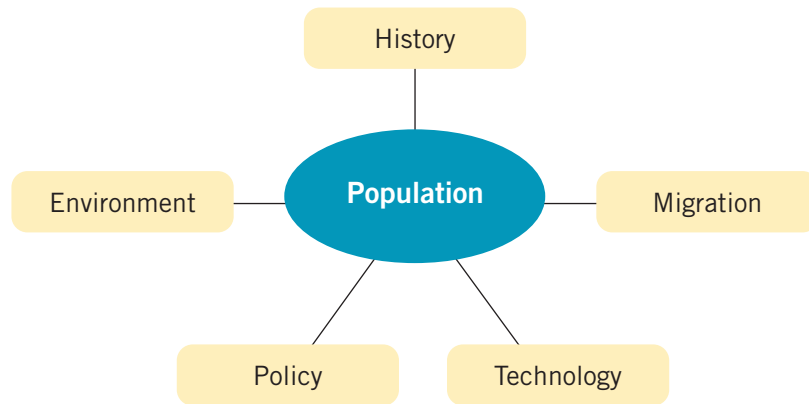
THINKING It Over

1. Use a provincial road map to locate examples and record the population of a hamlet, village, town, small city, city, and metropolitan area. Who might need to know this information? Explain. **kt**
2. Which type of settlement pattern does the region around your community have: scattered, linear or clustered? Using a map, suggest three reasons why this type of pattern is found in your area. Find a region in another country that has a similar pattern. Why are the patterns similar? **ka**
3. Construct a chart organizer for India, Egypt, Australia, and Macau. Include facts about population, distribution, and density. Use this information to assess and justify which location you would prefer to live in. **kc**
4. Calculate the population densities from the table above, and classify them as high, moderate, or low. Locate and label these places and the others from this section on a world map. Use three different colours to represent low, moderate, and high population density. **kt**

What Factors Affect Population?

You have seen that patterns of population distribution and density differ from place to place. In this section, you will explore five factors that combine to explain why some regions have more people than others.

Population Factors



During READING

Checkpoint

Look back at the predictions you made in the Before Reading exercise on page G 24. Assess your ideas as you go through this section.

Most Favourable Environments

- fertile agricultural land
- abundant natural resources
- water: coastlines and rivers
- city sites: meeting points, natural harbours

Least Favourable Environments

- mountains and infertile soils
- scarce natural resources
- extreme climate conditions: desert, polar
- isolated locations: continental interior

Environment and History

The environment may shape human choices, but it does not rule them. People are inventive and can use technology to overcome obstacles. For example, air conditioning has supported a population explosion in hot and humid Florida. Technology such as sleds and weapons also allowed the Inuit to populate the North. There are certain locations that are more attractive to people because they offer features such as a mild climate, fertile soil, fresh water, and natural transportation routes. That is where people are found in greatest numbers.

Historically, populations first expanded where agricultural civilizations prospered. Ancient empires in the Middle East, India, and China were established on fertile soils that could produce food. Great cities grew there at a time when many other regions still relied on hunting and gathering. In 680 BCE, China already had about 12 million people, a number which has multiplied more than 100 times since then. In fact, China and India have populations of over a billion; together the two countries have more than one-third of the world's population. How do you think these large populations affect the agriculture industry of the world today?

Migration

Throughout history, people have moved in search of a better life. Much of Canada's early European population chose to come here from France and Britain.

Immigration is the act of coming into a new country as a permanent resident. **Emigration** means leaving a home country to take up permanent residence elsewhere. An emigrant could be a Canadian actor moving to the United States in search of a big break. It could be someone coming to Canada for a few years, then returning to his or her homeland. **Net migration** measures the real effect of migration on population. A positive net migration means that more people moved into the country than the number who left in the same year. Comparisons between countries use a calculation called "net migration per 1000 population." This makes it easy to compare countries with high and low population density. Below is an example using data from 2005. How might migration have an effect on the populations already present in the destination country?

Country	Immigration	Emigration	Net Migration	Net Migration Per 1000 Population
Australia (population 20 310 000)	131 593	67 853	63 740	3.91

Technology and Policy

Technology can affect population by allowing people to make environments more livable. For example, irrigation systems in the California desert allow dry but fertile soil to produce crops. Technologies also influence human life and death, directly affecting population.

Natural Increase

The **birth rate** is the number of babies born each year for every 1000 people, while the **death rate** measures deaths per 1000 people. These rates can change due to catastrophes such as flood or war, but technology also has a great effect. Modern medicine, hospitals, and the reduction of disease have helped newborns survive and the elderly live longer. **Natural increase** uses birth rate and death rate to measure a country's actual growth.

WORDS MATTER

immigration the arrival of people into an area or country to live

emigration the departure of people from an area or country to live elsewhere

net migration the effect of migration on the population of a region or country

$$\frac{\text{Immigration} - \text{Emigration}}{\text{Net Migration}}$$

WEB LINK

Check a map of world migration on our Web site.

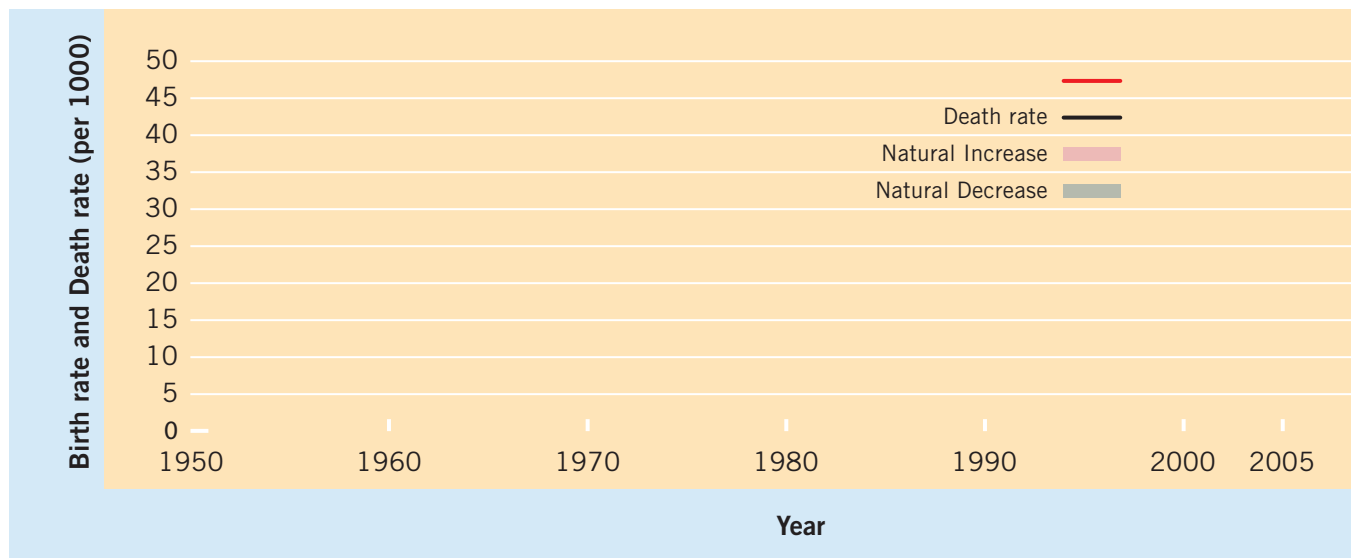
MATTER

birth rate the number of births per 1000 people per year

death rate the number of deaths per 1000 people per year

natural increase the birth rate minus the death rate

China, Natural Increase, 1950–2005



China's "Great Leap Forward," from 1958 to 1960, emphasized heavy industry at the expense of agriculture. How do you think this government policy affected population patterns?

$$\frac{\text{Birth rate} - \text{Death rate}}{\text{Natural increase}}$$

Government policies can also affect population, as in the case of China's "Great Leap Forward." China also created the One Child Policy. This policy was introduced in 1979 to limit the pressure of population increases on society. The policy continues today; couples are permitted only one child. Having a second child will result in heavy fines. China's rate of natural increase has dropped, but the One Child Policy has also had negative effects, including child abandonment. What could be the long-term effects of this policy—both positive and negative?

$$\frac{\text{Natural increase} + \text{Net migration}}{\text{Population change}}$$

THINKING It Over

1. Calculate the overall population change in 2005 for these countries.

K A

Country	Birth Rate per 1000	Death Rate per 1000	Net Migration per 1000
Canada	10.8	7.7	5.9
Mexico	21.0	4.7	-4.6
Mali	49.6	16.5	-6.3
Russia	9.8	14.5	1.0

2. Use a world map or an atlas to identify environmental characteristics of regions with high and low population density (as shown on the map on page G 29 of this chapter). Organize your findings in chart form using "High Density Regions" and "Low Density Regions" as headings. **T C**



China's One Child Policy has helped reduce the problems created by overpopulation, including strains on the health care system and on the environment. An earlier campaign used by the Chinese government during the 1970s encouraged couples to wait to have children, and to have more time between them. Together, these policies have succeeded in preventing China's population from reaching a staggering two billion. However, the One Child Policy does raise important questions about personal freedoms. State-run orphanages care for many thousands of abandoned children, the great majority of them girls. While thousands are adopted by Chinese or international families each year, many more grow up in the institutions.

In January of 2002, Mike and Sherri Boyd travelled to China to adopt a 10-month-old baby girl.

Sherri: We first met Jade in the restaurant at the hotel in Changsha, the capital city of Hunan Province. Other international families were staying there too. When the babies and their nannies arrived, the room was full of happy families meeting their daughters for the first time.

Mike: We were told that Jade had been abandoned at a street market and found when she was one day old. She was taken to the police station, and then to an orphanage. An adoption agency in Canada organized everything. A social worker did a home study and interview to see if we would be suitable.

The information went to China and we waited for 13 months until we heard that we could adopt.

Sherri: We know that Jade was cared for while she was in China. Her birth family must wonder how she is and what became of her. We love her so much and wish we could share with them what she is doing every day.

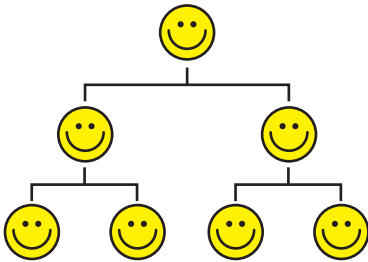


Jade and her family today

THINKING It Over

1. Write down four questions you would like to ask if you could meet the Boyds. Direct some questions to Jade. **t**
2. Write a paragraph weighing the pros and cons of China's One Child Policy. Discuss your conclusions about it in a small group. **c**
3. What effects could the policy have on rural communities in China? On city communities? **k t**

World Population Trends

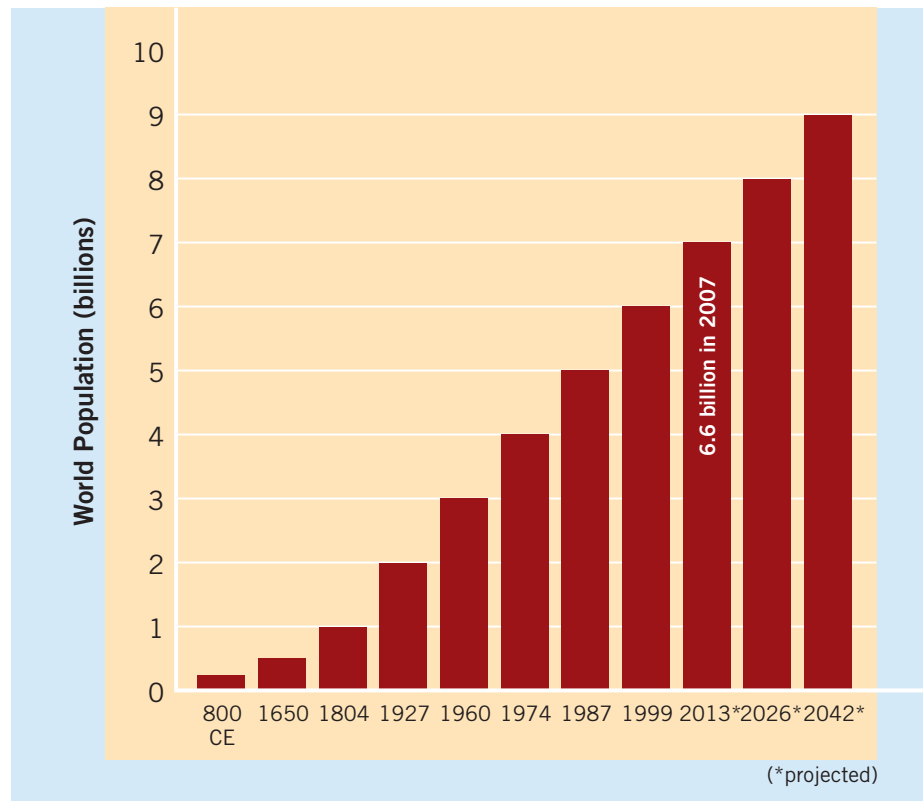


One day, thirteen-year-old Kwame offered to help more around the house. He asked for just a penny per day, to be doubled each day that he did a good job. His family laughed at Kwame’s idea, but after two weeks they didn’t find it so funny anymore. By then, he was asking for more than \$80 per day for his chores!

Population can multiply in the same way. For example, a large family can develop if a couple has two children and those children each have two children. By the time they reach their sixties, the couple will have two children and four grandchildren—six descendants. Of course, this describes only the birth rate. In reality, the death rate puts a natural check on population growth. In this section, you will see that world population has increased dramatically in the past two centuries. While natural increase rates are low today in developed countries, they remain much higher in most of the developing countries.

In 2007, the population of the world reached 6.6 billion people. Only two centuries ago, the world population was a mere one billion! Look at the graph below. Compare the milestone years for each billion to get a sense of how fast global population has multiplied.

World Population



Which billion was added most quickly? How long did it take? What does this suggest about the growth rate since then?

During READING

Checkpoint
Remember to add to your organizer while reading this graph.

The Population Boom

What happened to cause world population to grow so fast? To understand this, you must consider the **technological revolutions** that improved life and lowered death rates.

Three Revolutions

A revolution is a period of rapid change. Some are sudden political movements, while others are far-reaching technological changes. The revolutions in the chart below have caused great changes in world population. All three resulted in a sharp decline in death rates in Europe, where the revolutions first took place. From the early 1700s on, people began to migrate by the millions, especially to North and South America and Australia. Since 1850, the birth rate gradually fell in most countries as the **infant mortality rate** dropped due to advances in medicine. People could choose to have fewer children, as it was more likely that the children they did have would live to adulthood.

WORDS MATTER

technological revolution

sweeping changes brought about by new technology

infant mortality rate the rate of death for infants less than one year old

WEB LINK

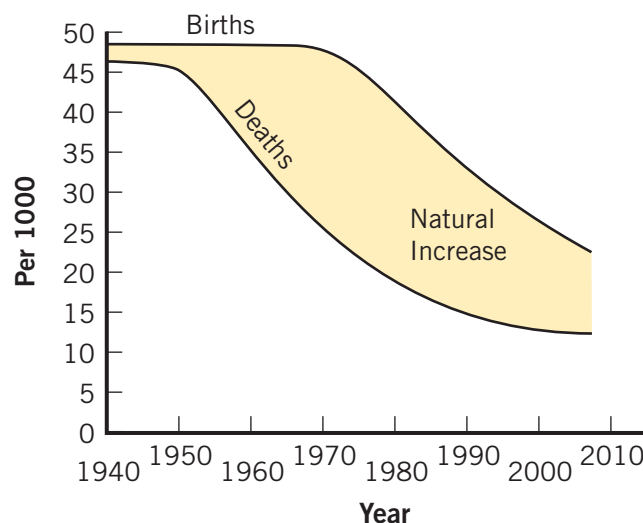
Study world population information on our Web site.

Time Period	Revolution	Description
1650–1800	Agricultural	Changes in animal breeding, crop rotation, and the use of simple farm machinery to increase food production
1750–1900	Industrial	Inventions such as steam-powered machinery used to produce large quantities of factory-made goods
1850–2000	Scientific (modern)	Scientific advances in chemistry, medicine and medical practices, public health knowledge, and food

In the Developing Countries

After the Second World War, the benefits of the revolutions spread. The United Nations, governments in developed countries, and the Red Cross began a movement to fight disease and lower the infant mortality rate. Death rates in the developing countries fell very quickly between 1950 and 1980, while birth rates remained high. On the graph you can see that birth rates fell too, but not until about 20 years later. Eventually people realized that families were becoming larger because of the sharp decrease in infant mortality. Meanwhile, some countries had already doubled their populations.

Typical Population Growth in Developing Countries since 1950



When did the death rate in developing countries begin to fall? Why?

Effects of the Population Boom

Changes in world population can have both global and local effects. How do you think the changes illustrated here might affect you and your future? What job skills might be in demand in Canada in the future because of changes in population?



People born during the 1945–1964 “baby boom” are the largest age group in most developed countries. As they grew up, their purchases of music, clothing, cars, and homes helped drive economic growth. As they grow older, they introduce greater numbers into the health care system. How can health care systems respond to such growth?

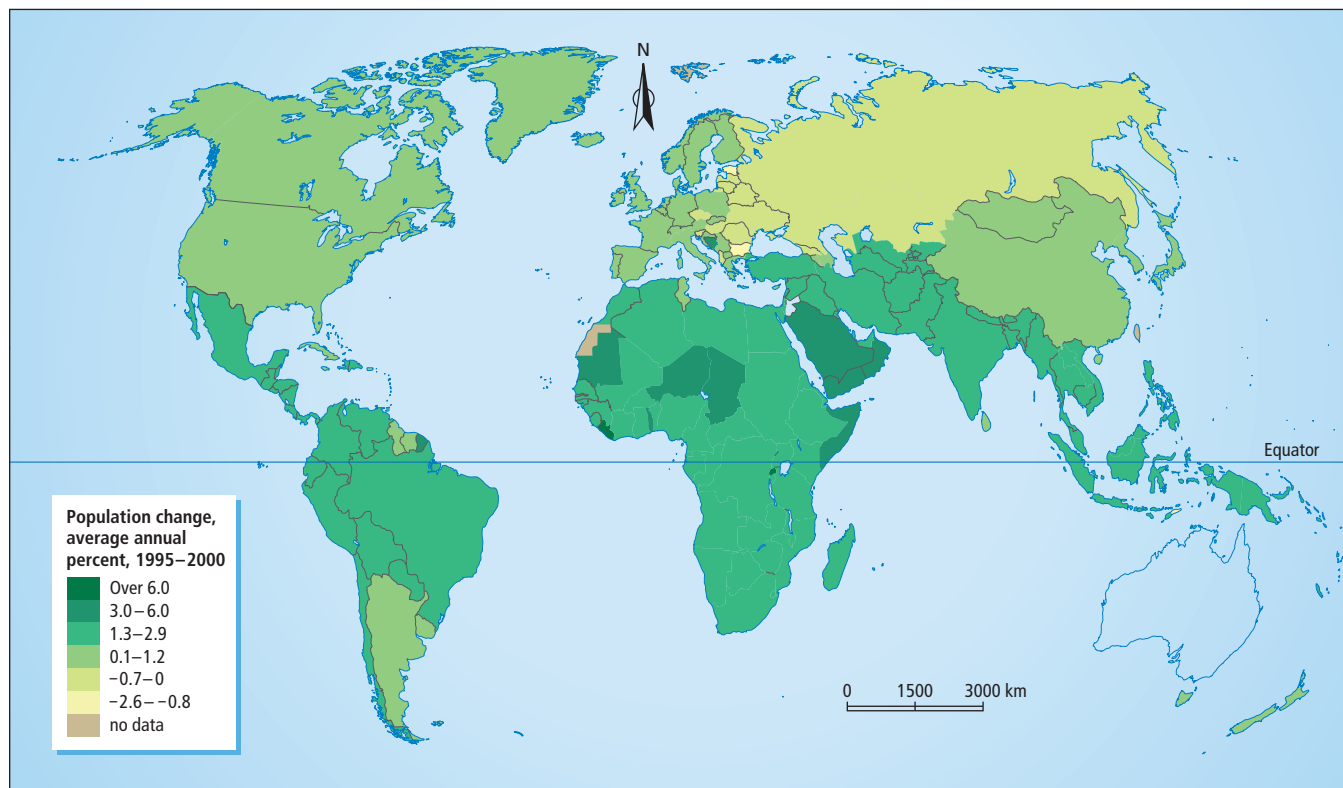
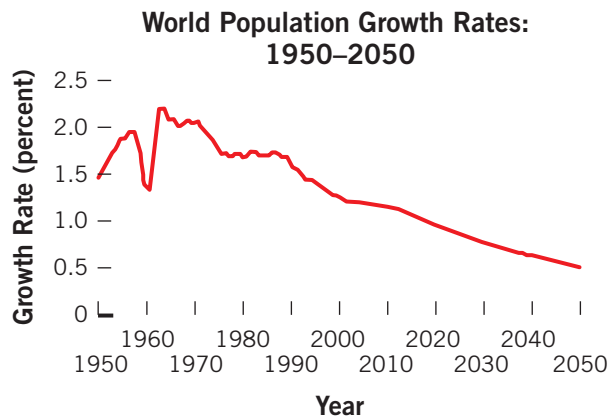
The population boom affects natural areas such as rain forests, which are home to two-thirds of the planet’s animal and plant species. Many rain forest plants are being studied as the source of new medicines. However, about half the area of these forests has been cleared since 1950. The Brazilian government encourages settlement of the Amazon rain forest. How can the rain forests be saved if populations continue to grow?



The population boom has put great pressure on food supply, especially in drier environments such as northern and southern Africa. Here, the ability of the land to feed the people (called carrying capacity) has been exceeded. War, natural disaster, climate change—any threat to food production—can soon cause famine and death. How should the world respond to such crises?

Predicting Population Change

The map below shows different rates of change in world population by continent. The small graph indicates an overall trend—a projected decrease in the *rate* of world population growth. The rate rose in the early 1960s due to a drop in the death rate. But since then, population birth rates have also dropped. Why do you think experts expect this trend to continue?



Where are populations still growing rapidly? Where are they actually declining?

THINKING It Over

- a) Use the bar graph of world population growth on page G 36 to calculate how many years it took for each doubling of world population. Start with .25 billion and continue to 6 billion. **K**

b) Briefly explain how the three revolutions—agricultural, industrial, and scientific (modern)—caused this accelerated growth rate. **K**
- What is your opinion about each of the questions asked for the three photos on page G 38? Compare views with a partner. **C**
- Use the world map of population change above to record observations by continent. How can you explain the patterns you see? **K T**
- Go back to the questionnaire on page G 26 and review your answers. Have you changed any of your opinions? What have you learned to improve your understanding of the topic? **K T**

GEO SKILL

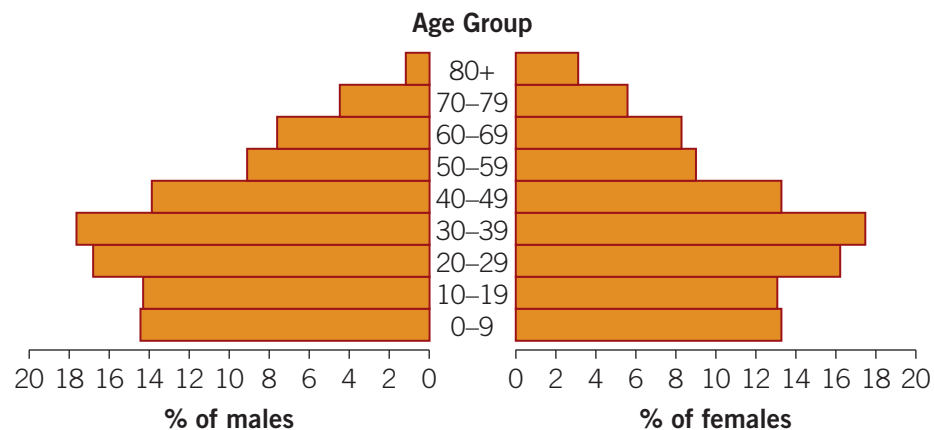
Drawing and Interpreting Population Pyramids

WORDS MATTER

population pyramid a graph showing the distribution of population by age and gender

A **population pyramid** is a graph that provides a snapshot of a country's population at one point in time. It can be used to find patterns by comparing two countries or two time periods. Most importantly, it can predict future changes in a society—something very useful as you consider your own career possibilities.

Canada Population Pyramid, 1991



During READING

Checkpoint

Use your organizer to make sure your graph has all of the right information.

Step 1 Set Up the Graph Page

A population pyramid is two horizontal bar graphs in one. The vertical scale shows the age groups in the population. Here you will be using ten-year groups: ages 0 to 9, 10 to 19, 20 to 29, and so on. The scale along the bottom shows the percentage of the population in each age group. The left side of the graph shows males and the right side females. The percentages increase in each direction from the centre point.

Step 2 Plot the Right Side of the Graph

You will find it easier to put the female data on the graph first, because you normally make a graph by working to the right of the vertical scale. After plotting points for each age group, use a ruler to make straight bars.

Step 3 Plot the Left Side of the Graph

Next, plot the points for each of the male age groups. Remember that these percentages increase as you move to the left of the vertical scale. Use a ruler to draw the bars.







Step 4 Finish the Graph

Label the graph, using the 1991 example as a model. It is always important to include the year of the population data.

Canada: Population, 2006

Percentage of Males	Age Group	Percentage of Females
11.5	0–9	10.8
13.5	10–19	12.6
13.6	20–29	13.0
14.4	30–39	13.8
16.8	40–49	16.3
13.6	50–59	13.6
8.4	60–69	8.8
5.3	70–79	6.4
2.6	80+	4.9





APPLY It

1. Follow the steps to draw and label a population pyramid for Canada in 2006. Use the 1991 example as a guide. 
2. Compare the two graphs. What difference do you notice between Canada's population above and below the age of 40 in 1991 and in 2006? 
3. Use the two graphs to decide how Canada's population pyramid might look in ten years (2016). How might this affect the plans of someone your age to be a a) kindergarten teacher? b) a doctor? c) a business person? Explain.  
4. Make a list of four questions you could ask to investigate why Canada's population characteristics changed between 1991 and 2006. 
5. Do some research into career areas that are expanding as Canadian baby boomers age. Choose one that interests you and find out about its educational requirements. 

The game winner combines the factors of birth, death, immigration, and emigration to create the largest total population increase for the country.

What You Will Need

A shuffled deck of 52 cards plus two Jokers

Spades	Hearts	Clubs	Diamonds
			
Death rate per 1000	Birth rate per 1000	Emigration rate per 1000	Immigration rate per 1000

Card Values

- All cards numbered 2 through 10 have their marked value.
- The face cards (Jack, Queen, King) are worth 11 points. Aces and Jokers have no value but do affect the game.
- An Ace allows the player to take any card from the person to the right, exchanging it for any card they hold.
- When a player draws a Joker, the round is finished and points are tallied.

How to Play

A. Play with 2, 3, or 4 people. First, remove Aces and Jokers from the deck before dealing out any cards.

B. Deal each person 6 cards. Players organize their cards into four groups by suit and put them face up. To the left, position the Hearts (births) above the Spades (deaths). On the right, position the Diamonds (immigration) above the Clubs (emigration).

C. Mix the Aces and Jokers back into the deck, shuffle and turn upside down.

D. Start with the oldest player and go clockwise. Each player discards one card and draws another from the top of the deck. Aim to maximize population score by discarding high black cards (death rate, emigration) in hopes of drawing high red ones (birth rate, immigration). If an Ace is drawn, discard it after exchanging cards.

E. When a Joker is drawn, the round ends. Players can then calculate their population scores. Start by adding together the values of any Hearts, Spades, Diamonds, and Clubs held. If no card of a particular suit is held, that sum is equal to zero.

Natural Increase = the sum of the Hearts minus the sum of the Spades.



Net Migration = the sum of the Diamonds minus the sum of the Clubs.

F. Record the population points on the score sheet. Calculate population change by adding the Natural Increase and Net Migration scores. Play another round. Continue for either three rounds or a time limit set by the teacher.

Sample Score Sheet

Round 1	Jillian M.
Natural increase (Hearts – Spades)	+ 12
Net migration (Diamonds – Clubs)	– 7
Population Change for the round	+ 5 per 1000 (i.e., .5%)

THINKING It Over

1. What strategies helped you to improve your score in the game? 
2. Explain how this game could be played for the winner to have the greatest population decrease. 

PUTTING IT ALL TOGETHER

This chapter has explored population patterns and trends around the world. You learned the difference between population distribution and density by using maps of Canada and the world. You saw how population around the world is affected by environment, history, migration, technology, and policy. Then, you used statistics, graphs, and a map to examine global patterns of population growth. You have also had the opportunity to examine how trends in population growth might affect you. Above all, you have gained a better understanding of the unit question, **How do patterns in human geography affect people around the world?**

After

READING

Analyze Graphs to Synthesize Information

Using your organizer, review and analyze the graphs in this chapter. Which country has the most geographical challenges for human survival? How do you know? What could the Canadian government, your community, and/or your family do to help?

Country A	Information (2004)	Country B
21 040 km ²	Area	41 532 km ²
6 948 073	Population	16 407 491
26.1	Birth rate per 1000	11.1
5.6	Death rate per 1000	8.7
67.5	Infant mortality per 1000	5.1
-3.5	Net migration	2.8

THINKING It Through

- Using the chart above, calculate the following for each country: a) population density, b) natural increase rate, and c) overall population change. **k a**
- Decide which one is a developed country and which one is a developing country. Explain your choices. **t**
- Use the information provided to explain whether or not there would be a pressing need for a) more schools, or b) more hospitals, in each country. **k a**
- Write a paragraph describing the effects of two population issues each country might soon face. **c a**